

What is Claimed is:

1 1. A gain controlled voltage controlled oscillator, comprising:
2 a current controlled oscillator adapted to provide an output signal
3 oscillating at a frequency controllable by controlling a current applied thereto;
4 a first current source providing a first control current controllable by
5 controlling a voltage applied thereto that has a predetermined range;
6 a first current mirror adapted to mirror the control current to the current
7 controlled oscillator; and
8 a second current source adapted to provide a second control current
9 for mirroring to the current controlled oscillator by the first current mirror when
10 the control voltage is in a low portion of the range.

1 2. A gain controlled voltage controlled oscillator as in Claim 1, wherein
2 the second current source comprises a diode-connected MOS transistor
3 connected in parallel with the first current source.

1 3. A gain controlled voltage controlled oscillator as in Claim 1, wherein
2 the first current source is a first MOS transistor having the control voltage
3 applied to a gate thereof and connected by its source and drain between an
4 input of the first current mirror and ground, and wherein the second current
5 source comprises:

6 a current source element providing a supplemental current;
7 a second current mirror comprising a second transistor and a third
8 MOS transistor, wherein the second MOS transistor is connected to the
9 current source element and the third MOS transistor is adapted to mirror the
10 supplemental current, the third MOS transistor being connected to the
11 common connection node of the first current source and the first current
12 mirror; and

13 a fourth MOS transistor having a gate connected to the gate of the first MOS
14 transistor and being connected by its source and drain between the current
15 source element and ground.